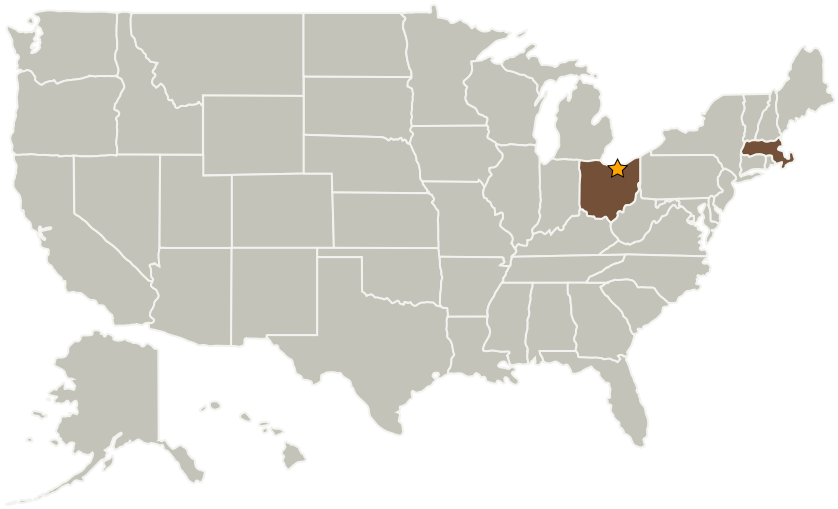
An Adaptive Chemistry Approach to Modeling Emissions Performance of Gas Turbine Combustors, Phase I

Completed Technology Project (2008 - 2008)

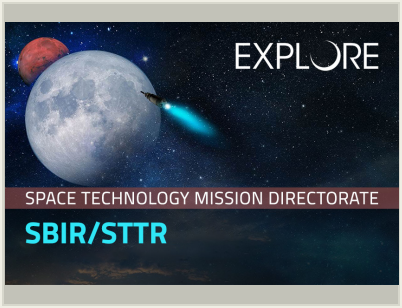
Project Introduction

In this proposed SBIR project, we seek to implement the Adaptive Chemistry methodology in existing CFD codes used to investigate the emissions performance of gas turbine engine combustors. We will demonstrate the feasibility of integrating Adaptive Chemistry algorithms to current CFD codes. We will also further develop the Adaptive Chemistry method to take advantage of species reduction enabling even larger CPU speedups. The value of the technique is enhanced predictive capability and computational efficiency of existing CFD codes for reacting flows such as gas turbine engine combustion systems. The successful completion of this project will produce the first CFD numerical code that is able to model detailed chemical kinetics as well as fluid dynamics. The end results allow the user to easily and transparently control the balance between computational efficiency and solution accuracy.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
★Glenn Research Center(GRC)	Lead Organization	NASA Center	Cleveland, Ohio
Aerodyne Research, Inc	Supporting Organization	Industry	Billerica, Massachusetts



An Adaptive Chemistry Approach to Modeling Emissions Performance of Gas Turbine Combustors, Phase I

Table of Contents

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Glenn Research Center (GRC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

An Adaptive Chemistry Approach to Modeling Emissions Performance of Gas Turbine Combustors, Phase I

Completed Technology Project (2008 - 2008)

Primary U.S. Work Locations	
Massachusetts	Ohio

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Hsi-wu Wong

Technology Areas

Primary:

- TX15 Flight Vehicle Systems
  - TX15.1 Aerosciences
    - TX15.1.7 Computational Fluid Dynamics (CFD) Technologies